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(54) Title: PLANTS HAVING IMPROVED GROWTH CHARACTERISTICS AND A METHOD FOR MAKING THE SAME

(57) Abstract: The present invention concerns a method for improving plant growth characteristics by increasing expression in a plant of a nucleic acid encoding a CCS52 protein and/or by increasing level and/or activity in a plant of a CCS52 protein. The invention also relates to transgenic plants having improved growth characteristics, such as increased plant size, increased organ size or increased number of organs, which plants have increased expression of a nucleic acid encoding a CCS52 protein.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, BIOSIS, MEDLINE, EMBL

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99/64451 A (CEBOLLA ANGEL ;KONDOROSI EVA (FR); KONDOROSI ADAM (FR); CENTRE NAT) 16 December 1999 (1999-12-16) cited in the application the whole document * in particular pages 9-11, figure 1B *	1-21
X	CEBOLLA A ET AL: "The mitotic inhibitor ccs52 is required for endoreduplication and ploidy-dependent cell enlargement in plants" EMBO JOURNAL, OXFORD UNIVERSITY PRESS, SURREY, GB, vol. 18, no. 16, 1999, pages 4476-4484, XP002125116 ISSN: 0261-4189 cited in the application the whole document ----- -/-	1-21

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☒ Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EMBL 7 May 2002 (2002-05-07), NGUYEN M. ET AL.: "Arabidopsis thaliana putative fizzy-related protein (At4g22910) mRNA, complete cds." XP002250756 Database accession no. AY099585 the whole document -----	10-12,14
X	DATABASE EMBL 3 July 1998 (1998-07-03), BEVAN M. ET AL.: "Arabidopsis thaliana DNA chromosome 4, BAC clone F7H19 (ESSA project)" XP002250757 Database accession no. AL031018 Positions: 25865 - 28572, note: strong similarity to fizzy-related protein -----	10-12,14
X	DATABASE EMBL 9 December 2001 (2001-12-09), "Arabidopsis thaliana putative Srw1 protein (At4gl1920) mRNA, complete cds." XP002250758 Database accession no. AY063875 the whole document -----	10-12,14
A	FAVERY BRUNO ET AL: "The endosymbiosis-induced genes ENOD40 and CCS52a are involved in endoparasitic-nematode interactions in Medicago truncatula." MOLECULAR PLANT-MICROBE INTERACTIONS, vol. 15, no. 10, October 2002 (2002-10), pages 1008-1013, XP008020613 ISSN: 0894-0282 the whole document -----	1-21
A	FOUCHER FABRICE ET AL: "Cell cycle regulation in the course of nodule organogenesis in Medicago." PLANT MOLECULAR BIOLOGY, vol. 43, no. 5-6, August 2000 (2000-08), pages 773-786, XP002250666 ISSN: 0167-4412 page 781, right-hand column - page 782, right-hand column -----	1-21
A	JOUBES J ET AL: "Endoreduplication in higher plants" PLANT MOLECULAR BIOLOGY, NIJHOFF PUBLISHERS, DORDRECHT, NL, vol. 43, no. 5-6, August 2000 (2000-08), pages 735-745, XP002240147 ISSN: 0167-4412 page 740, left-hand column ----- -/--	1-21

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 00/56905 A (VEYLDER LIEVEN DE ;INZE DIRK (BE); BURSSSENS SYLVIA (BE); CROPDESIG) 28 September 2000 (2000-09-28) the whole document -----	1-21
A	LI Z ET AL: "Comparison of promoters and selectable marker genes for use in Indica rice transformation" MOLECULAR BREEDING: NEW STRATEGIES IN PLANT IMPROVEMENT, KLUWER ACADEMIC PUBLISHERS, NL, vol. 3, no. 1, 1997, pages 1-14, XP002162549 ISSN: 1380-3743 the whole document -----	1-21

INTERNATIONAL SEARCH REPORT

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PCT/IB2004/000970

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
WO 9964451	A	16-12-1999	FR	2779433 A1		10-12-1999
			AU	4046599 A		30-12-1999
			CA	2330244 A1		16-12-1999
			EP	1086128 A2		28-03-2001
			WO	9964451 A2		16-12-1999
			JP	2002517221 T		18-06-2002

WO 0056905	A	28-09-2000	AU	4396000 A		09-10-2000
			CA	2367476 A1		28-09-2000
			WO	0056905 A2		28-09-2000
			EP	1163341 A2		19-12-2001
